

U.S. Navy Deputy Surgeon General Visits NAMRU-Dayton

By Dr. Richard D. Arnold, NAMRU-Dayton Scientific Director

Rear Adm. Michael H. Mittelman, U.S. Navy Deputy Surgeon General, visited Naval Medical Research Unit-Dayton ([NAMRU-Dayton](#)). NAMRU-Dayton Commanding Officer Capt. Keith Syring and his leadership team provided Mittelman an overview of command capabilities and facilities, showcasing the laboratory's multifaceted mission to support the fleet through toxicological and aeromedical research. The group toured the inhalation and environmental toxicology labs followed by the aeromedical laboratories. Research on submarine atmospheres, biofuel toxicity, jet fuel and noise-induced hearing loss, hypoxia detection and mitigation, motion-sickness countermeasures, and individualized fatigue assessment and modeling were among the projects highlighted.

Mittelman's visit to the aeromedical laboratories represented a homecoming of sorts. He served a tour of duty at the Naval Aerospace Medical Research Laboratory (NAMRL) early in his career when he was the Navy's first designated aerospace optometrist, ultimately serving as NAMRL's deputy director of research.

With the relocation of the NAMRL facilities from Naval Air Station Pensacola to Wright-Patterson Air Force Base, Mittelman's visit afforded him the opportunity to see both the continuity of mission from Pensacola and the outstanding new opportunities afforded through NAMRU-Dayton's association with the U.S. Air Force 711th Human Performance Wing and Harry G. Armstrong Center of Excellence for Aeromedical Research, Training, and Education at Wright-Patterson.

One other important Air Force association was made the day of the



Life scientist Michelle Okolica (right) describes results from the gas chromatograph-mass spectrometer to Rear Adm. Michael H. Mittelman, U.S. Navy Deputy Surgeon General.

Deputy Surgeon General's visit. Maj. Gen. Thomas W. Travis, U.S. Air Force Deputy Surgeon General, was aboard Wright-Patterson to tour U.S. Air Force 711th Human Performance Wing laboratories, and briefly visited NAMRU-Dayton's aeromedical facilities. Of particular interest to Travis was the Disorientation Research Device (DRD-Hercules), which is the Navy's contribution to a new state-of-the-art complex of large man-rated research devices being installed at the Armstrong Center. DRD-Hercules will be joined by a new Air Force high -G human centrifuge and two new hypobaric research chambers. Together these new devices represent a major investment in the future of aeromedical research. Through the support and leadership of both deputy surgeon generals, aeromedical research at Wright-Patterson Air Force Base holds unprecedented promise to reduce the greatest

health, safety and performance threats to our nation's military pilots and aircrews.

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Commanding Officer's Message

I am proud of your efforts throughout the enterprise in reaching out and giving back to the communities where you live and work. When we share our experiences and successes with the young people in our local schools, when we get them excited about science and make them aware of the great opportunities that a military or civilian career in Navy Medicine research and development offers, we are serving our country by encouraging these young people to think about their future education and career choices. We are planting the seeds that will grow the next generation of scientists capable of addressing future key challenges that will impact the health and well being of our warfighters.

A few recent examples include our team at NAMRU-3, who hosted a tour of eighth grade students from the Cairo American College Middle School as part of the students' study unit in infectious diseases. Students were able to see first-hand the work of scientists involved in this field of study. Members of the NMRC Biological Defense Research Directorate were judges for a middle school science fair in Frederick, Md. Researchers from NAMRU-2 Pacific in Hawaii have been asked to be guest speakers for high school microbiology classes. NMRC researchers were invited recently to participate in a panel discussion with the Navy Junior Reserve Officer Training Corps and the Medical Careers Academy of John F. Kennedy High School in Silver Spring, Md. They talked about how they got involved in research and how that work has shaped their lives.

This summer NMRC will be welcoming our high school and college interns, who will be with us for about ten weeks. Our goal is to encourage these students to pursue science and medical careers and to further their education by participating in research while being mentored by laboratory personnel. By your community outreach, you are encouraging these students in a way that will ensure Navy Medicine's CONUS and OCONUS laboratories consistently attract and retain highly motivated and talented researchers, foster scientific creativity, and stimulate cutting-edge studies with promising results. You are building our future and our sustainability.

Commanding Officer sends,
Richard L. Haberberger, Jr.
CAPT, MSC, USN



NMRC Hosts Seminar on the Epidemiology of Malaria in Africa

The Naval Medical Research Center ([NMRC](#)) Malaria Department hosted Dr. Steve Taylor of the University of North Carolina and Duke University March 2. Taylor presented his research on the molecular epidemiology of drug-resistant malaria in the Democratic Republic of the Congo. DRC suffers the second-highest global burden of malaria and accounts for an estimated 11 percent of cases of *Plasmodium falciparum* malaria in sub-Saharan Africa.

Taylor pointed out that among the five species of *Plasmodium* causing human malaria, *P. falciparum* is the most deadly and therefore has had the greatest impact on human society. Because the geographic distribution of *P. falciparum* overlaps with the geographic distribution of several disorders of human hemoglobin - such as hemoglobin S (HbS), HbC and the thalassemias - it has long been hypothesized that malaria and these disorders interact in some way. In fact, evidence indicates that these hemoglobinopathies protect against malaria, and this relationship appears especially likely for HbS, the cause of sickle cell anemia.

After reviewing over 50 years of literature, Taylor's team



Dr. Steve Taylor presented information on malaria in Africa.

employed meta-analyses to estimate the protective effect of the hemoglobinopathies on malaria. Case-control studies showed a decreased risk of severe malaria for HbAS (91

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Navy Surgeon General Testifies Before Congressional Committee

By Joshua L. Wick, BUMED Public Affairs

The U.S. Navy Surgeon General told members of Congress March 21, that Navy Medicine collectively remains strong and continues to meet their operational and wartime commitments.

Vice Adm. Matthew L. Nathan testified on the Defense Health Program Budget Overview to members of the Military Personnel Subcommittee of the House Armed Services Committee.

"Navy Medicine continues to provide world-class care for Sailors, Marines, their families and other beneficiaries around the globe, anytime, anywhere," said Nathan.

Alongside Nathan, several other Department of Defense senior medical leaders testified at the hearing, including Assistant Secretary of Defense for Health Affairs Dr. Jonathan Woodson, M.D.; Surgeon General of the Army Lt. Gen. Patricia D. Horoho; and Surgeon General of the Air Force Lt. Gen. Charles Bruce Green. The subcommittee also heard testimony from retired Air Force Col. Steve Strobridge, director of government relations for the Military Officers Association of America.

Nathan discussed specific areas of attention, from combat casualty care to the efforts being made to help Sailors and Marines suffering from traumatic brain injury and post-traumatic stress disorder as well as the comprehensive and holistic approach to wounded warrior recovery, not only for service members but for their families as well.

Nathan thanked the committee members for their confidence, support and investment in Navy Medicine's resource requirements. He said their efforts and commitment allow Navy Medicine to deliver a continuum of care from the battlefield to the bedside and from the bedside to unit, family, or transition.

He said that Navy Medicine is

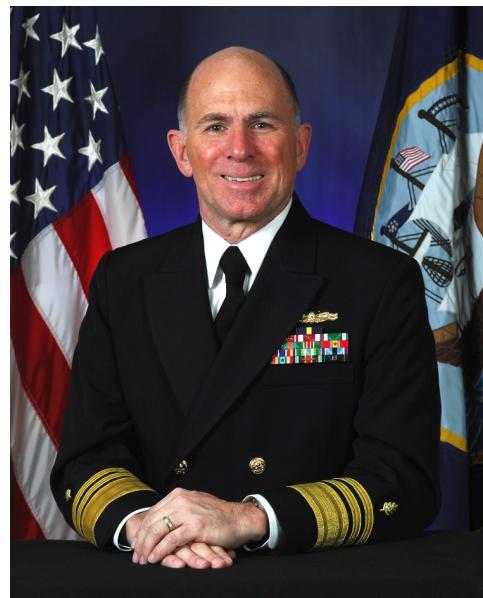
strategically aligned with the priorities of the secretary of the Navy, chief of naval operations and commandant of the Marine Corps.

"Each day, we are fully focused on executing the operational missions and core capabilities of the Navy and Marine Corps," said Nathan.

He reiterated, Force Health Protection is Navy Medicine's mission, is the foundation of our continuum of care in support of the warfighter, and optimizes Navy Medicine's ability to operate forward and promote and protect the fleet and Marine forces.

Nathan discussed specific areas of attention, from combat casualty care to the efforts being made to help Sailors and Marines suffering from traumatic brain injury and post-traumatic stress disorder as well as the comprehensive and holistic approach to wounded warrior recovery, not only for service members but for their families as well.

"Our wounded, ill and injured service members need to heal in body, mind and spirit and they deserve a seamless and comprehensive approach to their recovery," said Nathan. "Moving forward, we must continue to connect our heroes to approved emerging and advanced diagnostic and therapeutic options both within our



Center, Bethesda, Md., and their new and innovative treatments for traumatic brain injury and post-traumatic stress disorder. He emphasized the need to further expand the existing partnerships with the other services, Defense Centers of Excellence, Veterans Affairs, and leading academic medical and research centers.

Military Personnel Subcommittee Chairman, U.S. Rep. Joe Wilson, thanked the witnesses for their service and efforts and added that the subcommittee looks forward to working with them.

The Military Personnel Subcommittee is responsible for military personnel policy, Reserve component integration and employment issues, military health care, military education, and POW/MIA issues. This subcommittee ensures service members and their loved ones receive the first-class benefits they deserve.

As the U.S. Navy Surgeon General and Chief, Bureau of Medicine and Surgery, Nathan leads a global healthcare network of 63,000 Navy medical personnel around the world who provide high-quality health care to more than one million eligible beneficiaries. Navy Medicine personnel deploy with Sailors and Marines worldwide, providing critical mission support aboard ship, in the air, under the sea and on the battlefield.

NHRC Investigators Track Effectiveness of Adenovirus Vaccine

By Cmdr. Dennis J. Faix, Anthony Hawksworth, and Cmdr. Patrick J. Blair, NHRC

Military members have historically been afflicted by infectious pathogens due to the unique environments where they operate and/or the stress and fatigue imposed during operations. Recruits are particularly vulnerable to infections as a result of crowded living quarters and shared facilities. High rates of respiratory ailments in this population make "boot camp flu" and "recruit hack" common terms in the training lexicon.

In the early 1950s, Maurice Hilleman and Wallace Rowe independently isolated and characterized "the virus of the common cold." Adenoviruses (AdV), actually a family comprising 57 human types in seven species, were determined to be the most common cause of respiratory outbreaks in military recruits. Adenovirus types that often infect adults are AdV 3, 4, 7, 11 and 14, although the preponderance of infection is caused by AdV 4 and 7. Depending on the infecting type, symptoms can range from gastroenteritis to conjunctivitis. Most adenoviral diseases are self-limiting, but cases can be associated with a variety of clinical manifestations and disease syndromes with different degrees of severity. Some progress to pneumonia or death.

Adenovirus infections decreased dramatically at recruit training centers between 1971 and 1996 following immunization with an enteric vaccine against Ad-4 and Ad-7. However, the disease re-emerged when production ceased and vaccination was discontinued. In 2007, a multi-center, phase 3 study of a replacement vaccine was conducted by investigators at the Naval Health Research Center ([NHRC](#)) and Walter Reed Army Institute of Research (WRAIR) to assess the vaccine's safety and efficacy. Healthy adults in two basic training sites were randomly assigned to receive either vaccine or placebo. Vaccine efficacy was 99.3 percent. Seroconversion rates for vaccine recipients for AdV-4 and AdV-7 were 94.5 percent and 93.8 percent, respectively.

As a result of this safety trial, the Food and Drug Administration approved the new Ad-4/Ad-7 vaccine for use in the military in 2011.

Since 1996, NHRC has conducted population-based Febrile Respiratory Illness (FRI) surveillance at eight Department of Defense training sites. This surveillance has allowed for a historic record of the prevalence of AdV infection and was the impetus for re-establishing the vaccine in the DoD. After October 2011, when the basic training sites began administering vaccine to trainees, AdV-4 and AdV-7 disease has almost disappeared from the training sites, likely attributable to the

new vaccine. Recent data from NHRC evidences a remarkable reduction of almost 75 percent in the FRI rate beginning in mid-November 2011.

While rates will be monitored well into the future, investigators are encouraged. Describing this work, Cmdr. Dennis J. Faix, an investigator in the trial and also leader of the surveillance effort at NHRC, commented, "It is extremely gratifying to see the work of so many professionals culminate with such a clear demonstration of the effectiveness of this vaccine—the people that worked on this project can be proud that their efforts in preventing recruit illnesses and saving lives."

Adenovirus Vaccine Fielding Update

By Tiffany Holloway, U.S. Army Medical Research and Materiel Command Public Affairs Office

The U.S. military began administering Adenovirus Type 4 and Type 7 Vaccine, Live, Oral (Adenovirus vaccine) to recruits in basic training over a four-week period that began the week of October 24, 2011.

Since October, the manufacturer has shipped 100,800 doses of Adenovirus vaccine to the nine basic training sites, and the Services have administered approximately 50,000 doses of vaccine. Since January 2012, essentially all basic trainees present at the training sites have been immunized with Adenovirus vaccine, said Dr. Clifford Snyder, Jr., product manager for Adenovirus vaccine in the Pharmaceutical Systems Project Management Office of the U.S. Army Medical Materiel Development Activity.

According to Snyder, while several pathogens are known to cause Febrile Respiratory Illness (FRI), years of medical research in the basic training setting have shown that if trainees have been immunized with an effective flu vaccine, Adenovirus Type 4 has been the major pathogen associated with FRI. Thus, one can expect that administration of an effective Adenovirus vaccine containing a Type 4

component will lead to a marked reduction in the rate of FRI.

The published Naval Health Research Center data show a marked reduction in the FRI rate beginning in mid-November 2011. The amount of the reduction is about 75 percent. In addition, the number of specimens taken from FRI patients that are positive for disease-causing Adenovirus Type 4 has dropped to very low levels. According to Snyder, the striking reduction in the FRI rate is almost certainly attributable to the administration of Adenovirus vaccine.

"The results are undeniable when you look at the numbers," said Lt. Cmdr. Carolyn Winningham, Lovell Federal Health Care Center (FHCC) preventive medicine officer. "The vaccine is fast, effective and safe. At the end of the day, our job is about keeping U.S. Navy recruits healthy and in training. So, for us, the adenovirus vaccine has been a huge success."

Snyder put this achievement in perspective by stating, "Hundreds of people have worked hard to bring us to the point that senior leaders in the Department of Defense envisioned about 11 years ago, namely the time when military leaders no longer need to worry about the threat posed to military recruits by Adenovirus Types 4 and 7."

New NAMRU-2 Pacific HQ Supports Forward-deployed Missions

By Don Robbins, Assistant Editor,
Ho'okele

U.S. Naval Medical Research Unit No. 2 Pacific ([NAMRU-2 Pacific](#)) held a ribbon cutting and blessing ceremony as it moved into its new location at the site of the former Liberty in Paradise center at Joint Base Pearl Harbor-Hickam, February 20. Aaron Mahi performed a Hawaiian blessing and Chaplain Cmdr. Jon Brzek provided remarks at the ceremony.

The newly renovated Building 584 will house the headquarters element of NAMRU-2 Pacific, which conducts forward-deployed infectious disease surveillance and research in Southeast Asia and Oceania, primarily through a large laboratory detachment located in Phnom Penh, Cambodia, as well as a detachment in Singapore.

"The building puts us all in one location in close proximity to each other," said Capt. Gail Hathaway, commanding officer of NAMRU-2 Pacific. "As a headquarters staff, we work very closely to support our laboratory facilities in Southeast Asia."

"We support Adm. [Robert] Willard's [Commander, U.S. Pacific Command (PACOM)] theater security preparation initiatives in Southeast Asia and provide force health



Capt. Gail Hathaway, commanding officer of NAMRU-2 Pacific, and Capt. George Schoeler, executive officer of NAMRU-2, untie the lei during the ceremony for the new NAMRU-2 headquarters, February 29.

people assigned to the headquarters element, including administrative, research and enlisted and civilian personnel. Command headquarters was relocated from Jakarta, Indonesia in June 2010 and has been collocated with Navy Environmental and Preventive Medicine Unit No. 6 (NEPMU-6). NAMRU-2 Pacific has since outgrown the workspaces provided by NEPMU-6.

age throughout the PACOM AOR [Area of Responsibility]," Harrison added.

NAMRU-2 Pacific supports American interests in the Pacific Theater and advances U.S. diplomacy in the region by studying infectious diseases of critical public health important to the United States and other regional partners.

NAMRU-2 Pacific provides the United States with a continued forward presence that combines virology, microbiology, epidemiology, immunology, parasitology and entomology into a comprehensive capability to study tropical diseases where they occur. In this environment, new preventive measures and treatments can be tested and evaluated to provide better health measures for U.S. government personnel working in the region.

NAMRU-2 Pacific received a Meritorious Unit Commendation from the Secretary of the Navy for "...unparalleled success in providing direct technical and medical support to the operating forces of the United States Navy."

protection information in the way of research data on infectious disease. Our primary mission, and our function, is to study diseases that would be mission-abortive for U.S. troops. Primary diseases that we study are malaria, dengue, influenza, and diarrhea diseases," she said.

The building will house the 15

"The staff is extremely happy that we have our own space," said Capt. George Schoeler, executive officer of NAMRU-2 Pacific.

"This building gives us a little bit more stability," said Lt. Dustin Harrison, a microbiologist in the research department of NAMRU-2 Pacific.

"We have quite extensive cover-

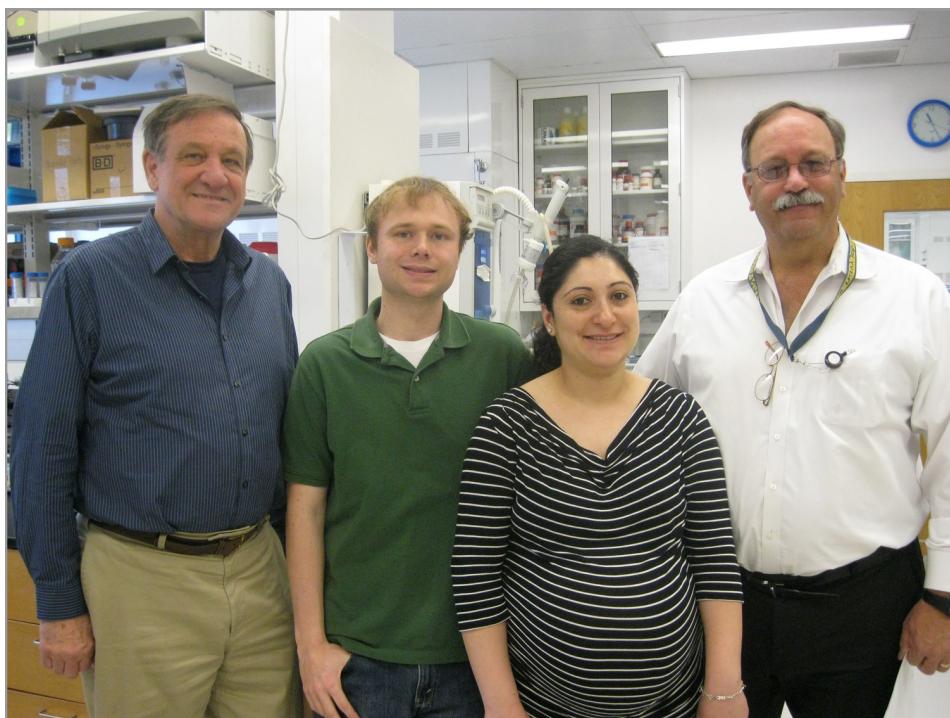
Navy Medicine Signs International Agreement with Canadian Military

Navy Medicine signed an international agreement for a collaborative research project on blast-induced brain injury. The work will be conducted by research teams from the Naval Medical Research Center ([NMRC](#)), Silver Spring, Md., and the laboratories at Defence Research and Development Canada, Suffield, Canada. The research involves investigating pathophysiological responses in the brain following exposures to blast overpressure. Allied warfighters remain at risk of injury and death following blast exposure, as do noncombatant civilians who might be exposed to blast during terrorist activities.

"The research includes assessing changes in specific neurotransmitter receptors," said Dr. Richard M. McCarron, head of the neurotrauma department at NMRC. "This study will investigate changes in various brain receptors following exposure to blast, study the role of proteases in the pathophysiology of blast-induced brain injury, and determine the potential of pharmacological agents to protect against this type of injury."

The initial research efforts will utilize the blast model developed in recent years at NMRC. The NMRC team will provide expertise in blast exposure and do laboratory testing. The samples and data collected at NMRC will be analyzed by researchers at the Canadian defense laboratory.

According to McCarron, the analysis will focus on the detection of expression of different glutamate receptors in the brain, specifically in the hippocam-



From left: Dr. Mikulas Chavko, head, blast research program; Mr. Jason Lankasky, research assistant; Dr. Usmah Kawoos, post-doctoral fellow; and Dr. Richard McCarron, head, neurotrauma department. Not pictured: Ms. Saleena Adeeb, research scientist.

pus, cortex and cerebellum. Glutamate is known to be released after traumatic brain injury and is toxic to brain tissue. However, the actual role of glutamate excitotoxicity in secondary brain damage after exposure to blast is not well known. The research will seek to determine whether changes in specific glutamate receptors contribute to neurocognitive, neurobehavioral and neurodegenerative changes observed after repeated blasts exposures.

"The data obtained from these studies may help to explain the basic mechanism(s) of blast-induced brain injury and may prove instrumental in determining blast overpressure thresholds for injury," said McCarron. "In subsequent studies, we will use pharmacological agents which are known to interact with glutamate receptors to determine if they can prevent or ameliorate blast-induced brain injury."

NAMRU-3 Maintains College of American Pathologists Accreditation

From NAMRU-3 Public Affairs

In April 2009, the U.S. Naval Medical Research Unit No. 3 ([NAMRU-3](#)) in Cairo, Egypt, achieved accreditation from the College of American Pathologists (CAP) for its diagnostics laboratory. On February 2, 2012, inspectors, including Dr. Bharati Jhaveri, a Governor of the CAP, visited the laboratory. Through the hard work of the laboratory's medical director, Cmdr. Denise L. Peet; coordinators, Lt. Cmdr. Brent L. House and Lt. Samuel Levin; and quality program

manager, Mr. Bassem Abdel Rahman, the inspection was a success. Pending correction of only one identified deficiency requirement, NAMRU-3 Diagnostics Laboratory will retain this rigorous accreditation.

As the first overseas U.S. Navy research laboratory to receive this type of accreditation, NAMRU-3 stands ready to provide patient testing for U.S. military members in the U.S. Central and Africa Commands in case of an infectious disease pandemic (like the 2009 H1N1 Influenza pandemic).

NAMRU-2 Researcher Teaches Microbiology at High School

Microbiologist Lt. Dustin Harrison from the Naval Medical Research Unit No. 2 ([NAMRU-2 Pacific](#)) in Pearl Harbor, Hawaii, spent some time giving back to the community by teaching a microbiology class to freshmen and sophomores at Hanlani Christian School, Mililani, Hawaii.

The students from Mr. Jeremy Caudill's Biological Sciences classes were treated to an overview of environmental and infectious disease microbiology, highlighting all of the "weird" things that microbes can do, complete with gruesome pictures of things like gas gangrene.

"It was fun to have a guy like him [Harrison] with a Ph.D. in micro give a class. When I told my two classes about a guest speaker they said 'it's probably gonna be some boring old guy,' which definitely was not the case. I don't think any of us knew

what we were going to get," said Caudill.

The two lectures concentrated on aspects of microbiology that most high school students are not exposed to in a freshman or sophomore biology class, like extremophilic archaeae ("bugs" that live at extreme hot or cold temperatures, including natural hot-springs) and strange bacteria like the magnetotactic bacteria that make magnets (used to guide the bacteria towards the optimum depth in a water column for required nutrients).

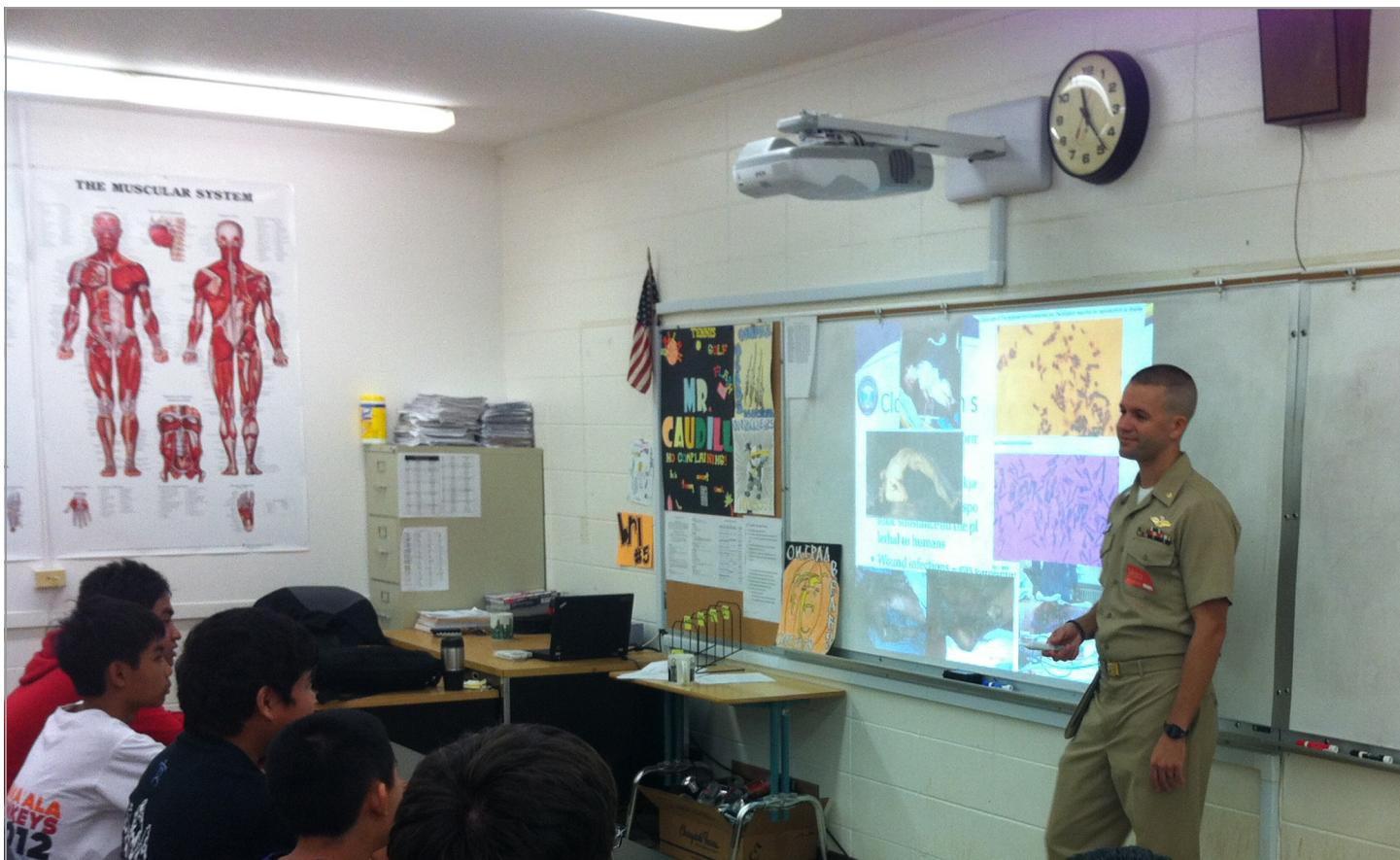
Aspects of infectious disease microbiology were also covered, including bacteria that cause diarrhea, flesh-eating bacteria, tuberculosis and many more.

"I think the kids were amazed by what bacteria make like yogurt, cheese, vitamins and other things they regularly use. It was awesome

that Dr. Harrison could take the time to give us a microbiology talk," said Caudill.

"It was fun teaching a high school science class. I like to think that I inspired the next generation of microbiologists, but only time will tell. I also think it's important to give back, and being a Navy microbiologist has been very good to me, so it was my turn to reach out to the community," commented Harrison.

NAMRU-2 Pacific's mission is to identify infectious disease threats of military and public health importance and develop and evaluate interventions and products to mitigate those threats. NAMRU-2 Pacific supports U.S. interests in the Pacific Theater by improving disease surveillance and outbreak response assistance for infectious diseases of critical public health importance to the U.S. and regional partners.



NAMRU-2 Pacific microbiologist Lt. Dustin Harrison (right) teaches at Hanlani Christian School, Mililani, Hawaii. Harrison presented an overview of environmental and infectious disease microbiology to the school's freshman and sophomore biology students.

Physical Activity Associated with Decreased PTSD Symptoms

New study results recently reported in the May/June issue of *Public Health Reports* reveal important associations between the development of post-traumatic stress disorder (PTSD) symptoms and physical activity levels among U.S. service members.

"Service members self-reported their level of daily physical activity, including performance of vigorous physical activity in a survey conducted by the Naval Health Research Center (NHRC) Millennium Cohort Study team," said Dr. Nancy Crum-Cianflone, principal investigator of the Millennium Cohort Study and head of the deployment health research department. "More than 38,000 survey participants from all branches of the service were evaluated over time for the development of symptoms suggestive of PTSD, a signature health condition among many military personnel returning from deployment to the current conflicts."

The study found that service members engaging in physical activity, especially vigorous exercise, were less likely to develop PTSD, even after taking into consideration military experiences such as deployment and combat exposures.

According to Crum-Cianflone, the study participants who reported at least 20 minutes of vigorous physical activity twice weekly showed a 40 percent decrease in PTSD symptoms. Those engaging in even higher exercise levels were less likely to experience persistent symptoms of PTSD such as hypervigilance, nightmares and irritability.

"These data provide critical



Sailors participate in a 5K fun run hosted by the ship's Morale, Welfare and Recreation Division on the flight deck aboard the Nimitz-class aircraft carrier USS Carl Vinson (CVN 70). Photo by Mass Communication Specialist 2nd Class James R. Evans.

information to potentially reduce PTSD among service members. While further research is needed, our current results indicate that physical activity may be important in the prevention of PTSD among service members," said Crum-Cianflone. "More than fifty percent of Millennium Cohort Study participants have deployed in support of the wars in Iraq and Afghanistan, and their continued contributions to the study enable investigators to evaluate detailed data from before, during and after deployments."

The NHRC Millennium Cohort Study is the largest prospective

military health study in the United States and captures data on service members from all of the military branches. The Millennium Cohort Study was initiated in 2001 by the Department of Defense (DoD) to address health concerns of military members about deployment and other potential service-related experience and currently has over 180,000 enrolled participants.

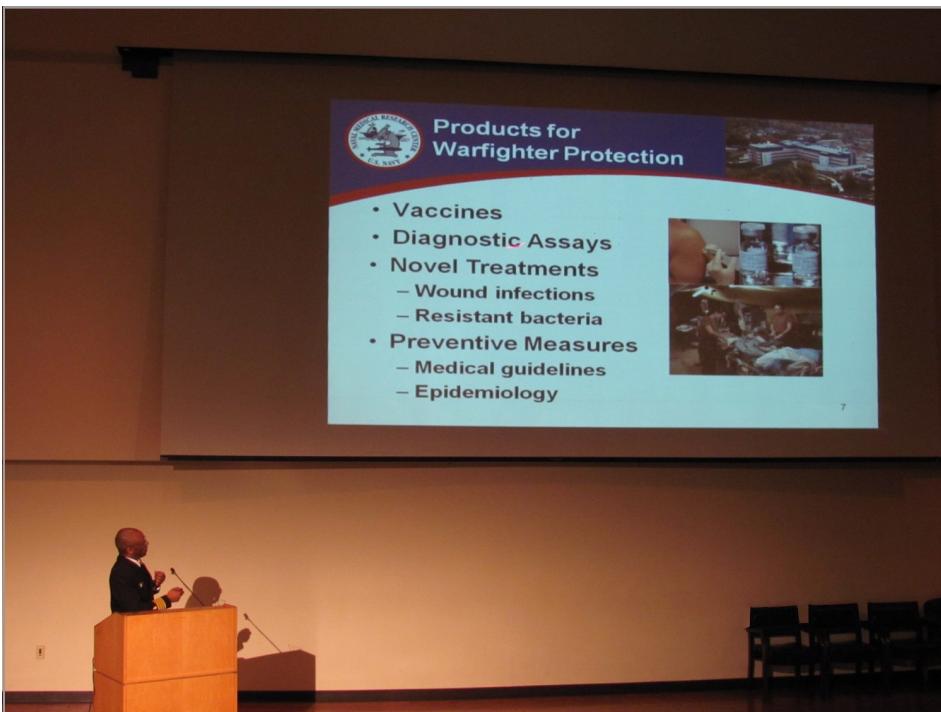
"The Millennium Cohort Study provides critical information toward understanding the long-term health of military members, contributing to force health protection, a DoD priority," said Crum-Cianflone.

NMRC's Nicholas Martin Competes in Combatives Tournament



The 2012 Medical Research and Material Command Combatives Tournament was held in the WRAIR/NMRC Auditorium March 23. Forty-two competitors in eight different weight classes competed for individual and team awards. Lt. Nicholas Martin of NMRC's Infectious Diseases Directorate, the lone Navy entrant in the tournament, finished third in the light heavyweight (186.0-205.9 pounds) division. He finished the tournament with three wins (two by submission by arm-bar) and two losses.

NMRC Part of Second NCA Research Summit at WRNMMC



Capt. Kevin Porter gives an overview of NMRC's infectious diseases research.

The Walter Reed National Military Medical Center (WRNMMC) in Bethesda, Md. hosted the second National Capital Area Research Summit, which brought together participants representing military and other federal and civilian biomedical researchers in the Washington, D.C. area.

Capt. Kevin Porter, director of infectious diseases research at the Naval Medical Research Center

(NMRC), Silver Spring, Md., presented an overview of his program. He highlighted the four research departments: viral and rickettsial diseases, enteric diseases, malaria, and the newest department, wound infections.

"The IDD departments have the unique research capability of developing new vaccines from the conceptual stage through construction, test tube

evaluation, laboratory modeling testing, human volunteer safety and immunogenicity trials and to final large-scale human volunteer field trials to prove efficacy as requested for FDA licensure of a vaccine," said Porter. "Research in wound infection began in 2011 in response to the needs of wounded warfighters. Wound infections are often difficult and costly to treat both in the hospital and during prolonged care. They have a significant impact on military readiness and the overall health and well-being of injured warfighters. The overarching research goal in IDD is to minimize the impact of these infections by preventing infection or clinical disease."

According to Lt. Col. Molly Klote, chief, department of research programs at WRNMMC, who hosted the summit, this second summit was designed to continue to build bridges and relationships with potential research partners in the national capital area. She pointed out that there is so much going on in this area between WRNMMC, NIH, WRAIR, NMRC, and the Uniformed Services University as well as other research organizations that a third summit is planned for October 15, 2012. Researchers who are interested in participating in the third summit should contact Luis Calvo at Luis.Calvo@med.navy.mil or 301-295-2269 for more information.

Writer Tours NAMRU-3, Sets Upcoming Novel in Cairo Lab

Kitty Pilgrim, world-renowned news correspondent and author, will use [NAMRU-3](#) as a setting for her new novel, *The Sardonyx Cup*. The story's plot in part explores the mysteries of ancient and modern-day Egypt.

Known for her ability to turn fact into fiction, Pilgrim spent extensive time conducting background research alongside Egyptologists and local researchers. On February 22, Pilgrim and her assistant/cameraman, William Croxton, visited NAMRU-3. Lt. Cmdr. David Rockabrand gave them an extensive tour of the command and discussed the unit's capabilities. Pilgrim's novel is due to be released June 26.

Photo, from left: William Croxton, Lt. Cmdr. David Rockabrand, Kitty Pilgrim, and NAMRU-3 commanding officer Capt. Robin M. Wilkening.



Laser Research in San Antonio Helps Understand Visual Limitations

By Joe N. Wiggins, NAMRU-San Antonio Public Affairs

When most people hear the word ‘lasers,’ they probably envision light shows during a live concert or the science fiction devices in a Hollywood action movie.

But scientists at the Naval Medical Research Unit-San Antonio ([NAMRU-San Antonio](#)) are continually working to use modern lasers to aid and protect warfighters in today’s battlefield by better understanding what they can and cannot do. Some of that research, as part of the unit’s Directed Energy mission, was recently discussed during a presentation

by one of the unit’s key scientists.

“In the modern battlefield, lasers come in all shapes and sizes, from continuous to blinking, green, white or red and in various strengths,” said Dr. Jeremy Beer, a principal investigator at NAMRU-San Antonio. “In a recent conference, I presented results from a study measuring the effects of continuous, discontinuous and alternating-wavelength laser glare on visual orientation and motion perception. By better understanding their capabilities and limitations, we expect to better inform as well as protect our troops.”

“Lasers can play a defense role on the battlefield,” Beer said. “Even at low

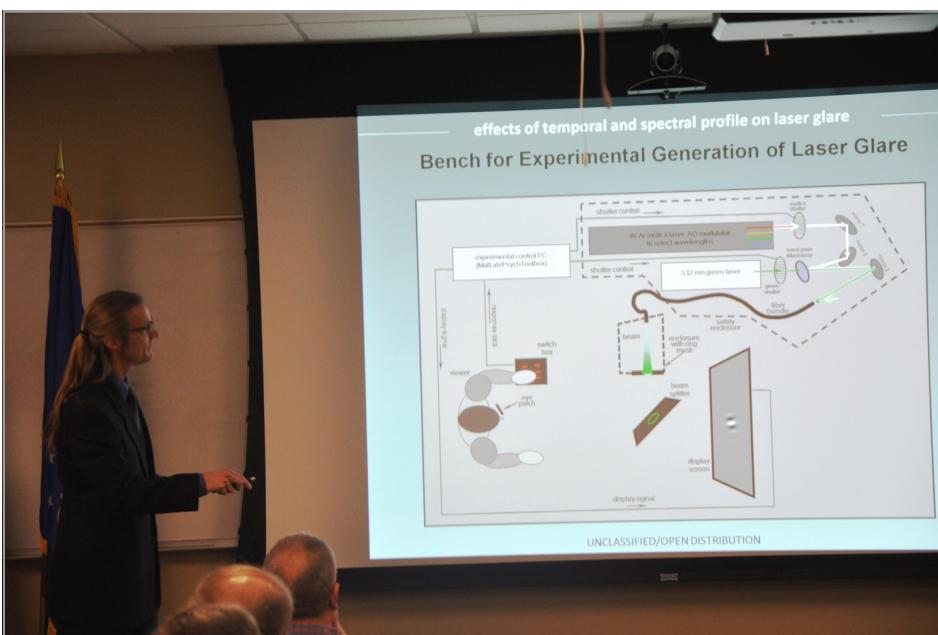
power levels that can’t harm human tissue, the laser can degrade visual performance by altering the ability to detect, recognize and perceive moving objects. In some cases, the laser can affect a viewer’s visual ability in ways he or she might not realize.”

“This particular study showed us that rapidly flashing laser glare occasionally caused subjects to commit errors in a motion identification task,” he said.

“Interestingly, this task failure went largely unnoticed by the volunteer test subjects, occurring sporadically and unpredictably. The knowledge base concerning bright-light effects on vision continues to develop and even predates the development of lasers, and includes military as well as civilian-developed research and findings.”

“These findings continue a long legacy of vision science research, going as far back as the findings of pioneers such as Dr. Samuel Howard Bartley, who first published his findings in 1938,” added Beer. “In our recent work, we have been able to challenge some previously assumed beliefs. In a controlled environment, we were able to accurately measure just how much and how often the subjects’ performance of various tasks was affected by a laser, and record the subjects’ perception of how they were being affected.”

NAMRU-San Antonio conducts this biomedical research to investigate the mechanisms underlying visual and cognitive disruption by a laser and in so doing strengthens the capability to assess health hazards and enhance operational safety and performance of Navy and Marine Corps personnel.



Dr. Jeremy Beer, a principal investigator of NAMRU-San Antonio, explains how researchers set up and measured results of testing various lasers and how they affected human subjects. Photo by Joe N. Wiggins.

NMRC Hosts Seminar on the Epidemiology of Malaria in Africa

(Continued from page 2)

percent), HbCC (73 percent), homozygous α-thalassemia (37 percent), and heterozygous α-thalassemia (27 percent). Only HbAS was consistently associated with protection against uncomplicated malaria (31 percent decrease). None demonstrated protection against asymptomatic parasitemia. Protection against severe malaria syndromes is

significant for HbAS, HbCC, HbAC, and homozygous and heterozygous α-thalassemia, but these hemoglobinopathies differ substantially in the degrees of protection.

By attenuating the severity of malaria, hemoglobinopathies serve as a model for investigating the mechanisms of malaria pathogenesis, potentially serving to identify novel molecular

mechanisms to serve as future targets for therapeutic or preventive measures.

Taylor is a post-doctoral fellow in the Department of Epidemiology, Gillings School of Public Health, University of North Carolina, and has an ongoing appointment as an infectious disease fellow in the Department of Infectious Diseases and International Health, Duke University.

NMRC Scientists Serve as Role Models for Local Students

At John F. Kennedy High School in Silver Spring, Md., two military researchers from the Naval Medical Research Center (NMRC) sat on a panel and spoke to an assembly of about five hundred students March 20. Capt. Kevin Porter, Infectious Diseases Directorate director and professor at the Uniformed Services University of the Health Sciences, and Lt. Vince Gerbasi discussed their decision to pursue a medical career in the U.S. Navy. Porter and Gerbasi shared their wisdom with the students about how they studied and remained dedicated to their goals to get where they are today.

Porter and Gerbasi both left the students with solid advice. Gerbasi urged students to find a profession they enjoy. Porter centered his speech on studying hard. His take-home message for the students was, "Don't cheat; study hard. To be successful, it takes desire, dedication, commitment and anything is possible!"

Lt. Rebecca Pavlicek also volunteers as a mentor with the school's Navy Junior Reserve Officer Training

Corps (NJROTC) students. After the assembly, the three officers were able to speak more directly with the NJROTC students about pursuing a medical career in the Navy.

Other panelists shared their experience about individual career decision. One panelist, from the Montgomery

County First Aid Unit, shared his experience as a paramedic. Another panelist described her work at Suburban Hospital in Montgomery County, Md. The topics discussed were targeted toward students who have an interest in careers that help advance the community.



NJROTC students from John F. Kennedy High School, Silver Spring, Md., meet with NMRC and other panelists.

Historian Discusses the Civil War's First Black Combat Unit



Military historian and author Dr. Ian Spurgeon was the guest speaker at the Naval Medical Research Center (NMRC) mentorship seminar series in February during Black History Month. His topic was "Raising Soldiers for the Army of Freedom: The Creation of the Civil War's First African American Combat Unit." Commemorating the 150th anniversary of the Civil War, Dr. Spurgeon shared his research on an important, but often overlooked, African American regiment.

Dr. Spurgeon revealed that Kansas was the first northern state to put African Americans in combat, not Massachusetts as some people believe. This radical step took place at a time when most African Americans in the United States were enslaved--four million slaves lived in the southern states in 1861.

At that time, persistent division between northern and southern states over the issue of slavery resulted in the secession of eleven southern states and the formation of the Confederate States of America.

In the face of strong opposition, black volunteers were turned away from joining the military during the first year and a half of the war. However, in the fall of 1862, as the Union war effort struggled, military and political leaders in the frontier state of Kansas formed the Union's first northern-raised black regiment and sent them into combat. This little-known unit--the 1st Kansas Colored Infantry Regiment--was formed several months prior to the establishment of the well-known 54th Massachusetts Infantry, on which the movie Glory was based. The unit was made up of fugitive slaves, freed men, and abolitionists who were fighting for the same cause: to rid the country of slavery.

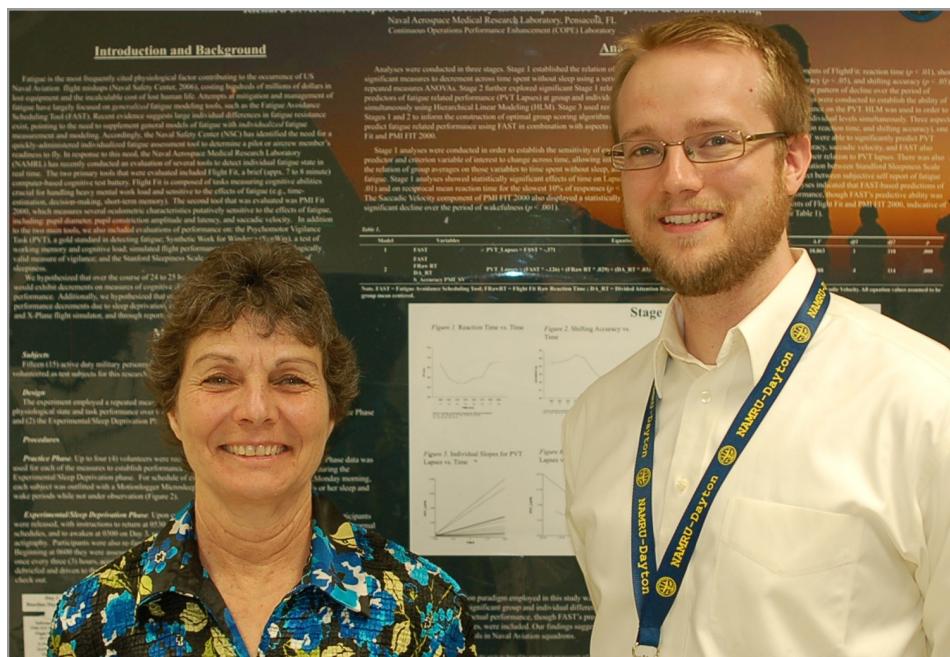
The regiment's first battle marked the first time a black unit saw combat during the Civil War. It took place in October 1862 near Butler, Missouri, and involved fewer than 300 men. The African American soldiers prevailed that day, but their victory was largely ignored as a small and insignificant skirmish. Nonetheless, it established an important landmark for black military service and helped pave the way for Abraham Lincoln's Emancipation Proclamation, which went into effect on January 1, 1863.

NAMRU-Dayton Scientists Attend Technical Course in Germany

The 2012 European Flight Surgeons' Conference and NATO Research and Technology Organization (RTO) technical course was held March 12-16 at Ramstein Air Base, Germany, at the NATO Headquarters Air Command Ramstein. This international meeting brings together aerospace medicine professionals to share knowledge and form partnerships. This year's conference and course focused on "Aircrrew Performance Enhancement and Sustainment." Attendance from 21 countries included physicians, mental health professionals, physiologists, researchers and medical enlisted personnel. Dr. Lynn Caldwell and Dr. Joseph Chandler attended as representatives of Naval Medical Research Unit-Dayton (NAMRU-Dayton).

Leaders from U.S. Department of Defense aeromedical organizations highlighted the broad range of experts who spoke. Col. Jay Neubauer, U.S. Air Forces in Europe (USAFE) Command Flight Surgeon, opened the meeting, followed by Col. Mark Coakwell, Conference Director and USAFE Chief of Aerospace Medicine.

Key addresses on the future and direction of aeromedical research and practice were given by Maj. Gen. Thomas Travis, USAF Deputy Surgeon General, and Maj. Gen. Douglas Robb, USAF Joint Staff Surgeon. Flight surgeons, scientists and physiologists from various countries, including the U.S., Germany, Iraq, England and Russia, presented universal aeromedical challenges in the unique context of their



From left: Scientists Dr. J. Lynn Caldwell and Dr. Joseph F. Chandler presented on fatigue-related topics at the NATO conference.

countries' defense organizations. Topics included medical standards, fatigue, health issues, operational resiliency and nutrition.

Caldwell, NAMRU-Dayton senior research psychologist, presented an overview of fatigue countermeasures, concluding with the dilemma of whether to use prescription stimulants during operations. Chandler, NAMRU-Dayton research psychologist, presented an overview of individual differences in fatigue susceptibility, including how measurement of these differences can add to the

ability of models to predict performance, leading to effective fatigue management.

The meeting served as an excellent venue for NAMRU-Dayton scientists to share current U.S. Naval research and form relationships with flight surgeons and other scientists from around the globe. These key collaborations, and the exchange of ideas they drive, uniquely inform discussions of operational needs, allowing for comprehensive solutions to the common aeromedical challenges experienced wherever military aviators fly.

NMR&D News

is an authorized publication of the Naval Medical Research Center, 503 Robert Grant Avenue, Silver Spring, MD 20910. *NMR&D News* is published monthly by the NMRC Public Affairs Office. Please contact the Public Affairs Officer at 301-319-9378 or svc.pao.nmrc@med.navy.mil with questions or to submit an article.

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